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GACCAATCGGAGTGTGGTGAATTTGGAAAATATTTGTGCGGGTTCC  
50 60 70 80 90  
TTTAGTTGTGTAATATAGTACTTTAGTTACAAATTGGAATAATTGG  
100 110 120 130 140  
CAGCAAAACCATCTGCAGCAACAAAATCATCTGCAGCTGCGAAATCAT  
150 160 170 180 190  
CTGCAGCAGCAAAAGCATCTTCAGGAGCGAGAAAAGCCCCAAATAATG  
200 210 220  
TGAG ATG GCA GTT GAC GTC CGA ATC GCT GCC TTC  
Met Ala Val Asp Val Arg Ile Ala Ala Phe  
230 240 250 260  
CTG CTG GTG TTT ATA GCG CCT GCA GTT TTA GCT CAA  
Leu Leu Val Phe Ile Ala Pro Ala Val Leu Ala Gln  
270 280 290  
GAG AGA TGT GGG TAT ATG ACC GCC ATC CCA AGG CTA  
Glu Arg Cys Gly Tyr Met Thr Ala Ile Pro Arg Leu  
300 310 320 330  
CCA CGA CCG GAT AAT TTG CCA GTA CTA AAT TTT GAA  
Pro Arg Pro Asp Asn Leu Pro Val Leu Asn Phe Glu  
340 350 360 370  
GGC CAG ACA TGG AGT CAG AGG CCC CTG CTC CCC GCC  
Gly Gln Thr Trp Ser Gln Arg Pro Leu Leu Pro Ala  
380 390 400  
CCG GAG CGG GAT GAC CTG TGC ATG GAC GCC TAC CAC  
Pro Glu Arg Asp Asp Leu Cys Met Asp Ala Tyr His  
410 420 430 440  
GTG ATA ACA GCC AAC CTC GGC ACG CAG GTC ATC TAC  
Val Ile Thr Ala Asn Leu Gly Thr Gln Val Ile Tyr  
450 460 470  
ATG GAT GAA GAG ATA GAA GAC GAA ATC ACC ATC GCC  
Met Asp Glu Glu Ile Glu Asp Glu Ile Thr Ile Ala  
480 490 500 510  
ATA CTT AAT TAT AAC GGA CCA TCA ACT CCG TTC ATT  
Ile Leu Asn Tyr Asn Gly Pro Ser Thr Pro Phe Ile

FIG. 1A

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520	530	540	550								
GAA	CTG	CCA	TTT	TTA	TCC	GGT	TCG	TAC	AAT	CTG	CTG
Glu	Leu	Pro	Phe	Leu	Ser	Gly	Ser	Tyr	Asn	Leu	Leu
560	570	580									
ATG	CCG	GTC	ATC	AGG	AGA	GTT	GAC	AAC	GGG	GAG	TGG
Met	Pro	Val	Ile	Arg	Arg	Val	Asp	Asn	Gly	Glu	Trp
590	600	610	620								
CAT	CTC	ATC	ATC	ACG	CAA	AGA	CAG	CAT	TAC	GAG	TTG
His	Leu	Ile	Ile	Thr	Gln	Arg	Gln	His	Tyr	Glu	Leu
630	640	650									
CCC	GGC	ATG	CAG	CAG	TAC	ATG	TTC	AAT	GTG	CGC	GTG
Pro	Gly	Met	Gln	Gln	Tyr	Met	Phe	Asn	Val	Arg	Val
660	670	680	690								
GAC	GGC	CAG	TCG	CTG	GTG	GCA	GGC	GTG	TCT	CTC	GCT
Asp	Gly	Gln	Ser	Leu	Val	Ala	Gly	Val	Ser	Leu	Ala
700	710	720	730								
ATC	GTC	AAC	ATA	GAT	GAC	AAC	GCG	CCC	ATC	ATA	CAA
Ile	Val	Asn	Ile	Asp	Asp	Asn	Ala	Pro	Ile	Ile	Gln
740	750	760									
AAC	TTC	GAG	CCT	TGC	CGG	GTT	CCT	GAA	CTG	GGC	GAG
Asn	Phe	Glu	Pro	Cys	Arg	Val	Pro	Glu	Leu	Gly	Glu
770	780	790	800								
CCA	GGG	TTG	ACA	GAA	TGC	ACA	TAC	CAA	GTA	TCG	GAC
Pro	Gly	Leu	Thr	Glu	Cys	Thr	Tyr	Gln	Val	Ser	Asp
810	820	830									
GCG	GAC	GGA	CGG	ATC	AGC	ACA	GAG	TTC	ATG	ACG	TTC
Ala	Asp	Gly	Arg	Ile	Ser	Thr	Glu	Phe	Met	Thr	Phe
840	850	860	870								
AGG	ATC	GAC	AGC	GTT	CGT	GGC	GAC	GAG	GAG	ACC	TTC
Arg	Ile	Asp	Ser	Val	Arg	Gly	Asp	Glu	Glu	Thr	Phe
880	890	900	910								
TAC	ATC	GAA	CGG	ACG	AAT	ATC	CCC	AAC	CAA	TGG	ATG
Tyr	Ile	Glu	Arg	Thr	Asn	Ile	Pro	Asn	Gln	Trp	Met
920	930	940									
TGG	CTA	AAT	ATG	ACC	ATA	GGC	GTT	AAT	ACC	TCG	CTC
Trp	Leu	Asn	Met	Thr	Ile	Gly	Val	Asn	Thr	Ser	Leu

**FIG. 1B**

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950	960	970	980
AAC TTC GTC ACC AGT CCG CTG CAT ATA TTC AGC GTG			
Asn Phe Val Thr Ser Pro Leu His Ile Phe Ser Val			
990	1000	1010	
ACA GCC CTG GAC TCG CTC CCG AAC ACC CAC ACG GTG			
Thr Ala Leu Asp Ser Leu Pro Asn Thr His Thr Val			
1020	1030	1040	1050
ACT ATG ATG GTG CAA GTG GCG AAT GTG AAC AGC			
Thr Met Met Val Gln Val Ala Asn Val Asn Ser			
1060	1070	1080	
CGT CCG CCG CGC TGG CTG GAG ATC TTC GCT GTC CAA			
Arg Pro Pro Arg Trp Leu Glu Ile Phe Ala Val Gln			
1090	1100	1110	1120
CAG TTT GAA GAG AAA TCT TAC CAA AAC TTC ACA			
Gln Phe Glu Glu Lys Ser Tyr Gln Asn Phe Thr			
1130	1140	1150	
GTG AGG GCG ATC GAC GGA GAC ACT GAG ATC AAT ATG			
Val Arg Ala Ile Asp Gly Asp Thr Glu Ile Asn Met			
1160	1170	1180	1190
CCT ATC AAC TAC AGG CTG ATC ACA AAT GAG GAA GAC			
Pro Ile Asn Tyr Arg Leu Ile Thr Asn Glu Glu Asp			
1200	1210	1220	
ACA TTC TTC AGC ATT GAG GCC CTG CCT GGT GGA AAA			
Thr Phe Phe Ser Ile Glu Ala Leu Pro Gly Gly Lys			
1230	1240	1250	1260
AGC GGG GCT GTA TTC CTC GTG TCG CCA ATT GAC			
Ser Gly Ala Val Phe Leu Val Ser Pro Ile Asp			
1270	1280	1290	
CGC GAC ACA CTG CAA CGA GAG GTG TTT CCA CTT ACG			
Arg Asp Thr Leu Gln Arg Glu Val Phe Pro Leu Thr			
1300	1310	1320	1330
ATC GTC GCT TAC AAA TAT GAT GAG GAG GCC TTC TCC			
Ile Val Ala Tyr Lys Tyr Asp Glu Glu Ala Phe Ser			
1340	1350	1360	
ACA TCA ACA AAC GTG GTC ATC ATT GTG ACA GAC ATC			
Thr Ser Thr Asn Val Val Ile Ile Val Thr Asp Ile			

**FIG. 1C**

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1370	1380	1390	1400
AAC GAC CAA AGA CCT GAA CCT ATA CAC AAG GAA			
Asn Asp Gln Arg Pro Glu Pro Ile His Lys Glu			
1410	1420	1430	
TAT CGA CTG GCA ATC ATG GAG GAG ACG CCC CTG ACC			
Tyr Arg Leu Ala Ile Met Glu Glu Thr Pro Leu Thr			
1440	1450	1460	1470
CTC AAC TTC GAT AAA GAA TTC GGA TTT CAT GAT			
Leu Asn Phe Asp Lys Glu Phe Gly Phe His Asp			
1480	1490	1500	
AAG GAT TTA GGT CAA AAC GCT CAG TAC ACG GTG CGT			
Lys Asp Leu Gly Gln Asn Ala Gln Tyr Thr Val Arg			
1510	1520	1530	1540
CTA GAG AGC GTG GAC CCT CCA GGC GCT GCT GAG GCA			
Leu Glu Ser Val Asp Pro Pro Gly Ala Ala Glu Ala			
1550	1560	1570	
TTC TAC ATA GCG CCT GAA GTC GGC TAC CAG CGA CAG			
Phe Tyr Ile Ala Pro Glu Val Gly Tyr Gln Arg Gln			
1580	1590	1600	1610
ACC TTC ATC ATG GGC ACC CTC AAT CAC TCC ATG			
Thr Phe Ile Met Gly Thr Leu Asn His Ser Met			
1620	1630	1640	
CTG GAT TAC GAA GTG CCA GAG TTT CAG AGT ATT ACG			
Leu Asp Tyr Glu Val Pro Glu Phe Gln Ser Ile Thr			
1650	1660	1670	1680
ATT CGG GTG GTA GCG ACC GAC AAC AAC GAC ACG			
Ile Arg Val Val Ala Thr Asp Asn Asn Asp Thr			
1690	1700	1710	
AGG CAC GTG GGC GTC GCG TTG GTT CAC ATT GAC CTC			
Arg His Val Gly Val Ala Leu Val His Ile Asp Leu			
1720	1730	1740	1750
ATC AAT TGG AAC GAT GAG CAG CCG ATC TTC GAA CAC			
Ile Asn Trp Asn Asp Glu Gln Pro Ile Phe Glu His			
1760	1770	1780	
GCC GTG CAG ACC GTC ACC TTC GAC GAG ACT GAA GGC			
Ala Val Gln Thr Val Thr Phe Asp Glu Thr Glu Gly			

**FIG. 1D**

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1790	1800	1810	1820
GAG GGG TTC TTC GTC GCC AAG GCG GTT GCA CAC			
Glu Gly Phe Phe Val Ala Lys Ala Val Ala His			
1830	1840	1850	
GAC AGA GAC ATC GGG GAT GTC GTC GAG CAT ACT TTA			
Asp Arg Asp Ile Gly Asp Val Val Glu His Thr Leu			
1860	1870	1880	1890
TTG GGT AAC GCT GTT AAC TTC CTG ACC ATC GAC			
Leu Gly Asn Ala Val Asn Phe Leu Thr Ile Asp			
1900	1910	1920	
AAA CTC ACC GGC GAC ATC CGC GTC TCA GCT AAC GAC			
Lys Leu Thr Gly Asp Ile Arg Val Ser Ala Asn Asp			
1930	1940	1950	1960
TCC TTC AAC TAC CAT CGA GAA AGT GAA TTA TTT GTG			
Ser Phe Asn Tyr His Arg Glu Ser Glu Leu Phe Val			
1970	1980	1990	
CAG GTG CGA GCT ACA GAC ACG CTG GGC GAA CCC TTC			
Gln Val Arg Ala Thr Asp Thr Leu Gly Glu Pro Phe			
2000	2010	2020	2030
CAC ACG GCG ACG TCA CAG CTG GTC ATA CGA CTA			
His Thr Ala Thr Ser Gln Leu Val Ile Arg Leu			
2040	2050	2060	
AAT GAC ATC AAC AAC ACG CCA CCC ACC TTA CGG CTG			
Asn Asp Ile Asn Asn Thr Pro Pro Thr Leu Arg Leu			
2070	2080	2090	2100
CCT CGA GGC AGT CCC CAA GTG GAG GAG AAC GTG			
Pro Arg Gly Ser Pro Gln Val Glu Glu Asn Val			
2110	2120	2130	
CCT GAT GGC CAC GTC ATC ACC CAG GAG TTA CGC GCC			
Pro Asp Gly His Val Ile Thr Gln Glu Leu Arg Ala			
2140	2150	2160	2170
ACC GAC CCC GAC ACC ACG GCC GAT CTG CGC TTC GAG			
Thr Asp Pro Asp Thr Thr Ala Asp Leu Arg Phe Glu			
2180	2190	2200	
ATA AAC TGG GAC ACC TCT TTC GCC ACC AAG CAA GGC			
Ile Asn Trp Asp Thr Ser Phe Ala Thr Lys Gln Gly			

**FIG. 1E**

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2210	2220	2230	2240
CGC CAG GCT AAC CCC GAC GAG TTT AGG AAT TGC			
Arg Gln Ala Asn Pro Asp Glu Phe Arg Asn Cys			
2250	2260	2270	
GTG GAA ATC GAG ACC ATC TTC CCC GAG ATT AAC AAC			
Val Glu Ile Glu Thr Ile Phe Pro Glu Ile Asn Asn			
2280	2290	2300	2310
CGG GGA CTG GCT ATC GGC CGC GTT GTA GCG CGC			
Arg Gly Leu Ala Ile Gly Arg Val Val Ala Arg			
2320	2330	2340	
GAA ATC AGA CAC AAC GTG ACC ATA GAC TAC GAG GAG			
Glu Ile Arg His Asn Val Thr Ile Asp Tyr Glu Glu			
2350	2360	2370	2380
TTT GAG GTC CTC TCC CTC ACA GTG AGG GTG CGT GAC			
Phe Glu Val Leu Ser Leu Thr Val Arg Val Arg Asp			
2390	2400	2410	
CTT AAC ACC GTC TAC GGA GAC GAC TAC GAC GAA TCG			
Leu Asn Thr Val Tyr Gly Asp Asp Tyr Asp Glu Ser			
2420	2430	2440	2450
ATG CTC ACA ATA ACT ATA ATC GAT ATG AAC GAC			
Met Leu Thr Ile Thr Ile Ile Asp Met Asn Asp			
2460	2470	2480	
AAC GCG CCG GTG TGG GTG GAG GGG ACT CTG GAG CAG			
Asn Ala Pro Val Trp Val Glu Gly Thr Leu Glu Gln			
2490	2500	2510	2520
AAC TTC CGA GTC CGC GAG ATG TCG GCG GGC GGG			
Asn Phe Arg Val Arg Glu Met Ser Ala Gly Gly			
2530	2540	2550	
CTC GTG GTG GGC TCC GTG CGC GCG GAC GAC ATC GAC			
Leu Val Val Gly Ser Val Arg Ala Asp Asp Ile Asp			
2560	2570	2580	2590
GGA CCG CTC TAC AAC CAA GTG CGA TAC ACC ATT TTC			
Gly Pro Leu Tyr Asn Gln Val Arg Tyr Thr Ile Phe			
2600	2610	2620	
CCT CGT GAA GAC ACA GAT AAG GAC CTG ATA ATG ATC			
Pro Arg Glu Asp Thr Asp Lys Asp Leu Ile Met Ile			

**FIG. 1F**

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2630	2640	2650	2660								
GAC	TTC	CTC	ACG	GGT	CAA	ATT	TCC	GTG	AAC	ACA	
Asp	Phe	Leu	Thr	Gly	Gln	Ile	Ser	Val	Asn	Thr	
2670	2680	2690									
AGC	GGC	GCC	ATC	GAC	GCG	GAT	ACT	CCT	CCA	CGC	TTC
Ser	Gly	Ala	Ile	Asp	Ala	Asp	Thr	Pro	Pro	Arg	Phe
2700	2710	2720	2730								
CAC	CTC	TAC	TAT	ACA	GTG	GTC	GCT	AGT	GAC	CGA	
His	Leu	Tyr	Tyr	Thr	Val	Val	Ala	Ser	Asp	Arg	
2740	2750	2760									
TGC	TCG	ACA	GAA	GAT	CCT	GCA	GAT	TGC	CCC	CCT	GAC
Cys	Ser	Thr	Glu	Asp	Pro	Ala	Asp	Cys	Pro	Pro	Asp
2770	2780	2790	2800								
CCG	ACT	TAT	TGG	GAA	ACC	GAA	GGA	AAT	ATC	ACA	ATC
Pro	Thr	Tyr	Trp	Glu	Thr	Glu	Gly	Asn	Ile	Thr	Ile
2810	2820	2830									
CAC	ATC	ACC	GAC	ACG	AAC	AAC	AAG	GTC	CCG	CAG	GCG
His	Ile	Thr	Asp	Thr	Asn	Asn	Lys	Val	Pro	Gln	Ala
2840	2850	2860	2870								
GAA	ACG	ACT	AAG	TTC	GAT	ACC	GTC	GTG	TAT	ATT	
Glu	Thr	Thr	Lys	Phe	Asp	Thr	Val	Val	Tyr	Ile	
2880	2890	2900									
TAC	GAG	AAC	GCA	ACC	CAC	TTA	GAC	GAG	GTG	GTC	ACT
Tyr	Glu	Asn	Ala	Thr	His	Leu	Asp	Glu	Val	Val	Thr
2910	2920	2930	2940								
CTG	ATA	GCC	AGT	GAT	CTT	GAC	AGA	GAC	GAA	ATA	
Leu	Ile	Ala	Ser	Asp	Leu	Asp	Arg	Asp	Glu	Ile	
2950	2960	2970									
TAC	CAC	ACG	GTG	AGC	TAC	GTC	ATC	AAT	TAT	GCA	GTG
Tyr	His	Thr	Val	Ser	Tyr	Val	Ile	Asn	Tyr	Ala	Val
2980	2990	3000	3010								
AAC	CCT	CGA	CTG	ATG	AAC	TTC	TTC	TCC	GTG	AAC	CGA
Asn	Pro	Arg	Leu	Met	Asn	Phe	Phe	Ser	Val	Asn	Arg
3020	3030	3040									
GAG	ACC	GGC	CTG	GTG	TAC	GTG	GAC	TAT	GAG	ACC	CAG
Glu	Thr	Gly	Leu	Val	Tyr	Val	Asp	Tyr	Glu	Thr	Gln

**FIG. 1G**

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3050	3060	3070	3080
GGT AGT GGC GAG GTG CTG GAC CGT GAT GGT GAT			
Gly Ser Gly Glu Val Leu Asp Arg Asp Gly Asp			
3090	3100	3110	
GAA CCA ACG CAC CGT ATC TTC TTC AAC CTC ATC GAC			
Glu Pro Thr His Arg Ile Phe Phe Asn Leu Ile Asp			
3120	3130	3140	3150
AAC TTC ATG GGG GAA GGA GAA GGT AAC AGA AAT			
Asn Phe Met Gly Glu Gly Glu Asn Arg Asn			
3160	3170	3180	
CAG AAC GAC ACA GAA GTT CTC GTT ATC TTG TTG GAT			
Gln Asn Asp Thr Glu Val Leu Val Ile Leu Leu Asp			
3190	3200	3210	3220
GTG AAT GAC AAT GCT CCT GAA TTG CCA CCG CCG AGC			
Val Asn Asp Asn Ala Pro Glu Leu Pro Pro Pro Ser			
3230	3240	3250	
GAA CTC TCT TGG ACT ATA TCT GAG AAC CTT AAG CAG			
Glu Leu Ser Trp Thr Ile Ser Glu Asn Leu Lys Gln			
3260	3270	3280	3290
GGC GTC CGT CTT GAA CCA CAT ATC TTC GCC CCG			
Gly Val Arg Leu Glu Pro His Ile Phe Ala Pro			
3300	3310	3320	
GAC CGC GAC GAG CCC GAC ACA GAC AAC TCC AGG GTC			
Asp Arg Asp Glu Pro Asp Thr Asp Asn Ser Arg Val			
3330	3340	3350	3360
GGC TAC GAG ATC CTG AAC CTC AGC ACG GAG CGG			
Gly Tyr Glu Ile Leu Asn Leu Ser Thr Glu Arg			
3370	3380	3390	
GAC ATC GAA GTG CCG GAG CTG TTT GTG ATG ATA CAG			
Asp Ile Glu Val Pro Glu Leu Phe Val Met Ile Gln			
3400	3410	3420	3430
ATC GCG AAC GTC ACG GGA GAG CTG GAG ACC GCC ATG			
Ile Ala Asn Val Thr Gly Glu Leu Glu Thr Ala Met			
3440	3450	3460	
GAC CTC AAG GGA TAT TGG GGG ACG TAC GCT ATA CAT			
Asp Leu Lys Gly Tyr Trp Gly Thr Tyr Ala Ile His			

**FIG. 1H**

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3470	3480	3490	3500
ATA CGG GCA TTC GAC CAC GGC ATT CCG CAA ATG			
Ile Arg Ala Phe Asp His Gly Ile Pro Gln Met			
3510	3520	3530	
TCC ATG AAC GAG ACA TAT GAG CTG ATC ATC CAT CCG			
Ser Met Asn Glu Thr Tyr Glu Leu Ile Ile His Pro			
3540	3550	3560	3570
TTC AAC TAC TAC GCG CCT GAG TTC GTC TTC CCG			
Phe Asn Tyr Tyr Ala Pro Glu Phe Val Phe Pro			
3580	3590	3600	
ACC AAC GAT GCC GTC ATA CGA CTT GCG AGG GAA CGA			
Thr Asn Asp Ala Val Ile Arg Leu Ala Arg Glu Arg			
3610	3620	3630	3640
GCT GTA ATC AAT GGA GTT CTA GCG ACA GTG AAC GGA			
Ala Val Ile Asn Gly Val Leu Ala Thr Val Asn Gly			
3650	3660	3670	
GAG TTC TTG GAG CGG ATA TCG GCG ACT GAT CCG GAC			
Glu Phe Leu Glu Arg Ile Ser Ala Thr Asp Pro Asp			
3680	3690	3700	3710
GGA CTC CAC GCG GGC GTC GTC ACC TTC CAA GTG			
Gly Leu His Ala Gly Val Val Thr Phe Gln Val			
3720	3730	3740	
GTA GGC GAT GAG GAA TCA CAA CGG TAC TTT CAA GTA			
Val Gly Asp Glu Glu Ser Gln Arg Tyr Phe Gln Val			
3750	3760	3770	3780
GTT AAC GAT GGC GAG AAC CTC GGC TCG TTG AGG			
Val Asn Asp Gly Glu Asn Leu Gly Ser Leu Arg			
3790	3800	3810	
TTA CTG CAA GCC GTT CCA GAG GAG ATC AGG GAG TTC			
Leu Leu Gln Ala Val Pro Glu Glu Ile Arg Glu Phe			
3820	3830	3840	3850
CGG ATA ACG ATT CGC GCT ACA GAC CAG GGA ACG GAC			
Arg Ile Thr Ile Arg Ala Thr Asp Gln Gly Thr Asp			
3860	3870	3880	
CCA GGA CCG CTG TCC ACG GAC ATG ACG TTC AGA GTT			
Pro Gly Pro Leu Ser Thr Asp Met Thr Phe Arg Val			

**FIG. 11**

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3890	3900	3910	3920
GTT TTT GTG CCC ACG CAA GGA GAA CCT AGA TTC			
Val Phe Val Pro Thr Gln Gly Glu Pro Arg Phe			
3930	3940	3950	
GCG TCC TCA GAA CAT GCT GTC GCT TTC ATA GAA AAG			
Ala Ser Ser Glu His Ala Val Ala Phe Ile Glu Lys			
3960	3970	3980	3990
AGT GCC GGC ATG GAA GAG TCT CAC CAA CTT CCT			
Ser Ala Gly Met Glu Glu Ser His Gln Leu Pro			
4000	4010	4020	
CTA GCA CAA GAC ATC AAG AAC CAT CTC TGT GAA GAC			
Leu Ala Gln Asp Ile Lys Asn His Leu Cys Glu Asp			
4030	4040	4050	4060
GAC TGT CAC AGC ATT TAC TAT CGT ATT ATC GAT GGC			
Asp Cys His Ser Ile Tyr Tyr Arg Ile Ile Asp Gly			
4070	4080	4090	
AAC AGC GAA GGT CAT TTC GGC CTG GAT CCT GTT CGC			
Asn Ser Glu Gly His Phe Gly Leu Asp Pro Val Arg			
4100	4110	4120	4130
AAC AGG TTG TTC CTG AAG AAA GAG CTG ATA AGG			
Asn Arg Leu Phe Leu Lys Lys Glu Leu Ile Arg			
4140	4150	4160	
GAA CAA AGT GCC TCC CAC ACT CTG CAA GTG GCG GCT			
Glu Gln Ser Ala Ser His Thr Leu Gln Val Ala Ala			
4170	4180	4190	4200
AGT AAC TCG CCC GAT GGT GGC ATT CCA CTT CCT			
Ser Asn Ser Pro Asp Gly Gly Ile Pro Leu Pro			
4210	4220	4230	
GCT TCC ATC CTT ACT GTC ACT GTT ACC GTG AGG GAG			
Ala Ser Ile Leu Thr Val Thr Val Thr Val Arg Glu			
4240	4250	4260	4270
GCA GAC CCT CGT CCA GTG TTT GTG AGG GAA TTG TAC			
Ala Asp Pro Arg Pro Val Phe Val Arg Glu Leu Tyr			
4280	4290	4300	
ACC GCA GGG ATA TCC ACA GCG GAC TCC ATC GGC AGA			
Thr Ala Gly Ile Ser Thr Ala Asp Ser Ile Gly Arg			

**FIG. 1J**

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4310	4320	4330	4340
GAG CTG CTC AGA TTA CAT GCG ACC CAG TCT GAA			
Glu Leu Leu Arg Leu His Ala Thr Gln Ser Glu			
4350	4360	4370	
GGC TCG GCC ATT ACT TAT GCT ATA GAC TAC GAT ACA			
Gly Ser Ala Ile Thr Tyr Ala Ile Asp Tyr Asp Thr			
4380	4390	4400	4410
ATG GTA GTG GAC CCC AGC CTG GAG GCA GTG AGA			
Met Val Val Asp Pro Ser Leu Glu Ala Val Arg			
4420	4430	4440	
CAG TCG GCT TTC GTA CTG AAC GCT CAA ACC GGA GTG			
Gln Ser Ala Phe Val Leu Asn Ala Gln Thr Gly Val			
4450	4460	4470	4480
CTG ACG CTT AAT ATC CAG CCC ACG GCC ACG ATG CAT			
Leu Thr Leu Asn Ile Gln Pro Thr Ala Thr Met His			
4490	4500	4510	
GGA CTG TTC AAA TTC GAA GTC ACA GCT ACT GAC ACG			
Gly Leu Phe Lys Phe Glu Val Thr Ala Thr Asp Thr			
4520	4530	4540	4550
GCC GGC GCT CAG GAC CGC ACC GAC GTC ACC GTG			
Ala Gly Ala Gln Asp Arg Thr Asp Val Thr Val			
4560	4570	4580	
TAC GTG GTA TCC TCG CAG AAC CGC GTC TAC TTC GTG			
Tyr Val Val Ser Ser Gln Asn Arg Val Tyr Phe Val			
4590	4600	4610	4620
TTC GTC AAC ACG CTG CAA CAG GTC GAA GAC AAC			
Phe Val Asn Thr Leu Gln Gln Val Glu Asp Asn			
4630	4640	4650	
AGA GAC TTT ATC GCG GAC ACC TTC AGC GCT GGG TTC			
Arg Asp Phe Ile Ala Asp Thr Phe Ser Ala Gly Phe			
4660	4670	4680	4690
AAC ATG ACC TGC AAC ATC GAC CAA GTG GTG CCC GCT			
Asn Met Thr Cys Asn Ile Asp Gln Val Val Pro Ala			
4700	4710	4720	
AAC GAC CCC GTC ACC GGC GTG GCG CTG GAG CAC AGC			
Asn Asp Pro Val Thr Gly Val Ala Leu Glu His Ser			

**FIG. 1K**

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4730	4740	4750	4760
ACG CAG ATG CGC GGC CAC TTC ATA CGG GAC AAC			
Thr Gln Met Arg Gly His Phe Ile Arg Asp Asn			
4770	4780	4790	
GTA CCC GTA CTC GCT GAT GAG ATA GAA CAG ATC CGT			
Val Pro Val Leu Ala Asp Glu Ile Glu Gln Ile Arg			
4800	4810	4820	4830
AGT GAC CTA GTC CTC CTG AGC TCG ATA CAA ACA			
Ser Asp Leu Val Leu Leu Ser Ser Ile Gln Thr			
4840	4850	4860	
ACG CTG GCG GCG CGA TCG CTG GTG TTG CAG GAC TTG			
Thr Leu Ala Ala Arg Ser Leu Val Leu Gln Asp Leu			
4870	4880	4890	4900
TTG ACC AAC TCC AGC CCG GAC TCG GCG CCT GAC TCG			
Leu Thr Asn Ser Ser Pro Asp Ser Ala Pro Asp Ser			
4910	4920	4930	
AGC CTC ACG GTG TAC GTG CTG GCC TCA CTG TCT GCT			
Ser Leu Thr Val Try Val Leu Ala Ser Leu Ser Ala			
4940	4950	4960	4970
GTG CTC GGT TTC ATG TGC CTT GTG CTA CTG CTT			
Val Leu Gly Phe Met Cys Leu Val Leu Leu Leu			
4980	4990	5000	
ACC TTC ATC ATC AGG ACT AGA GCG CTA AAC CGA CGG			
Thr Phe Ile Ile Arg Thr Arg Ala Leu Asn Arg Arg			
5010	5020	5030	5040
TTG GAA GCC CTG TCG ATG ACG AAG TAC GGC TCA			
Leu Glu Ala Leu Ser Met Thr Lys Tyr Gly Ser			
5050	5060	5070	
CTG GAC TCT GGA TTG AAC CGC GCC GGC ATC GCC GCC			
Leu Asp Ser Gly Leu Asn Arg Ala Gly Ile Ala Ala			
5080	5090	5100	5110
CCC GGC ACC AAC AAA CAC ACT GTG GAA GGC TCC AAC			
Pro Gly Thr Asn Lys His Thr Val Glu Gly Ser Asn			
5120	5130	5140	
CCT ATC TTC AAT GAA GCA ATA AAG ACG CCA GAT TTA			
Pro Ile Phe Asn Glu Ala Ile Lys Thr Pro Asp Leu			

**FIG. 1L**

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5150	5160	5170	5180								
GAT	GCC	ATT	AGC	GAG	GGT	TCC	AAC	GAC	TCT	GAT	
Asp	Ala	Ile	Ser	Glu	Gly	Ser	Asn	Asp	Ser	Asp	
5190	5200	5210									
CTG	ATC	GGC	ATC	GAA	GAT	CTT	CCG	CAC	TTT	GGC	AAC
Leu	Ile	Gly	Ile	Glu	Asp	Leu	Pro	His	Phe	Gly	Asn
5220	5230	5240	5250								
GTC	TTC	ATG	GAT	CCT	GAG	GTG	AAC	GAA	AAG	GCA	
Val	Phe	Met	Asp	Pro	Glu	Val	Asn	Glu	Lys	Ala	
5260	5270	5280									
AAT	GGT	TAT	CCC	GAA	GTC	GCA	AAC	CAC	AAC	AAC	AAC
Asn	Gly	Tyr	Pro	Glu	Val	Ala	Asn	His	Asn	Asn	Asn
5290	5300	5310	5320								
TTC	GCT	TTC	AAC	CCG	ACT	CCC	TTC	TCG	CCT	GAG	TTC
Phe	Ala	Phe	Asn	Pro	Thr	Pro	Phe	Ser	Pro	Glu	Phe
5330	5340	5350	5360								
GTT	AAC	GGA	CAG	TTC	AGA	AAG	ATC	TAGAAGATAACAAACA			
Val	Asn	Gly	Gln	Phe	Arg	Lys	Ile				
5370	5380	5390	5400	5410							
CTAGTTAACATTAATTTGGAGTTGGAATTAAAGATTTGAAAG											
5420	5430	5440	5450								
GATAGTTGTGATAAGCCTGTGATTTTAAA	ACTGTAATTGAAAAAA										
5460	5470	5480	5490	5500							
AAAATTGAGACCTCCATTAAAGCTCTGCTCATCTCATCAAATT	TT										
5510	5520	5530	5540	5550							
ATAAAATGCCATTAGTCATTAAGATACTCGATTAAAGATTATT											
5560	5570	5580									
TAAGATATTATGTAAAATAATATTGTC											

**FIG. 1M**

**14/21**  
**SEQ ID NO. 2**

Met Ala Val Asp Val Arg Ile Ala Ala Phe Leu Leu  
1 5 10  
Val Phe Ile Ala Pro Ala Val Leu Ala Gln Glu Arg  
15 20  
Cys Gly Tyr Met Thr Ala Ile Pro Arg Leu Pro Arg  
25 30 35  
Pro Asp Asn Leu Pro Val Leu Asn Phe Glu Gly Gln  
40 45  
Thr Trp Ser Gln Arg Pro Leu Leu Pro Ala Pro Glu  
50 55 60  
[CAD1]

Arg Asp Asp Leu Cys Met Asp Ala Tyr His Val Ile  
65 70  
Thr Ala Asn Leu Gly Thr Gln Val Ile Tyr Met Asp  
75 80  
Glu Glu Ile Glu Asp Glu Ile Thr Ile Ala Ile Leu  
85 90 95  
Asn Tyr Asn Gly Pro Ser Thr Pro Phe Ile Glu Leu  
100 105  
Pro Phe Leu Ser Gly Ser Tyr Asn Leu Leu Met Pro  
110 115 120  
Val Ile Arg Arg Val Asp Asn Gly Glu Trp His Leu  
125 130  
Ile Ile Thr Gln Arg Gln His Tyr Glu Leu Pro Gly  
135 140  
Met Gln Gln Tyr Met Phe Asn Val Arg Val Asp Gly  
145 150 155  
Gln Ser Leu Val Ala Gly Val Ser Leu Ala Ile Val  
160 165 [CAD2]  
Asn Ile Asp Asp Asn Ala Pro Ile Ile Gln Asn Phe  
170 175 180  
Glu Pro Cys Arg Val Pro Glu Leu Gly Glu Pro Gly  
185 190  
Leu Thr Glu Cys Thr Tyr Gln Val Ser Asp Ala Asp  
195 200  
Gly Arg Ile Ser Thr Glu Phe Met Thr Phr Arg Ile  
205 210 215

**FIG. 2A**

**15/21**

Asp Ser Val Arg Gly Asp Glu Glu Thr Phe Tyr Ile  
220 225  
Glu Arg Thr Asn Ile Pro Asn Gln Trp Met Trp Leu  
230 235 240  
Asn Met Thr Ile Gly Val Asn Thr Ser Leu Asn Phe  
245 250  
Val Thr Ser Pro Leu His Ile Phe Ser Val Thr Ala  
255 260  
Leu Asp Ser Leu Pro Asn Thr His Thr Val Thr Met  
265 270 275  
Met Val Gln Val Ala Asn Val Asn Ser Arg Pro Pro  
280 285  
→ CAD3

Arg Trp Leu Glu Ile Phe Ala Val Gln Gln Phe Glu  
290 295 300  
Glu Lys Ser Tyr Gln Asn Phe Thr Val Arg Ala Ile  
305 310  
Asp Gly Asp Thr Glu Ile Asn Met Pro Ile Asn Tyr  
315 320  
Arg Leu Ile Thr Asn Glu Glu Asp Thr Phe Phe Ser  
325 330 335  
Ile Glu Ala Leu Pro Gly Gly Lys Ser Gly Ala Val  
340 345  
Phe Leu Val Ser Pro Ile Asp Arg Asp Thr Leu Gln  
350 355 360  
Arg Glu Val Phe Pro Leu Thr Ile Val Ala Tyr Lys  
365 370  
Tyr Asp Glu Glu Ala Phe Ser Thr Ser Thr Asn Val  
375 380  
Val Ile Ile Val Thr Asp Ile Asn Asp Gln Arg Pro  
385 → CAD4 390 395  
Glu Pro Ile His Lys Glu Tyr Arg Leu Ala Ile Met  
400 405  
Glu Glu Thr Pro Leu Thr Leu Asn Phe Asp Lys Glu  
410 415 420  
Phe Gly Phe His Asp Lys Asp Leu Gly Gln Asn Ala  
425 430

**FIG. 2B**

**16/21**

Gln Tyr Thr Val Arg Leu Glu Ser Val Asp Pro Pro  
435 440  
Gly Ala Ala Glu Ala Phe Tyr Ile Ala Pro Glu Val  
445 450 455  
Gly Tyr Gln Arg Gln Thr Phe Ile Met Gly Thr Leu  
460 465  
Asn His Ser Met Leu Asp Tyr Glu Val Pro Glu Phe  
470 475 480  
Gln Ser Ile Thr Ile Arg Val Val Ala Thr Asp Asn  
485 → [CAD5] 490  
Asn Asp Thr Arg His Val Gly Val Ala Leu Val His  
495 500  
Ile Asp Leu Ile Asn Trp Asn Asp Glu Gln Pro Ile  
505 510 515  
Phe Glu His Ala Val Gln Thr Val Thr Phe Asp Glu  
520 525  
Thr Glu Gly Glu Gly Phe Phe Val Ala Lys Ala Val  
530 535 540  
Ala His Asp Arg Asp Ile Gly Asp Val Val Glu His  
545 550  
Thr Leu Leu Gly Asn Ala Val Asn Phe Leu Thr Ile  
555 560  
Asp Lys Leu Thr Gly Asp Ile Arg Val Ser Ala Asn  
565 570 575  
Asp Ser Phe Asn Tyr His Arg Glu Ser Glu Leu Phe  
580 585  
Val Gln Val Arg Ala Thr Asp Thr Leu Gly Glu Pro  
590 595 600  
Phe His Thr Ala Thr Ser Gln Leu Val Ile Arg Leu  
605 610 → [CAD6]  
Asn Asp Ile Asn Asn Thr Pro Pro Thr Leu Arg Leu  
→ 615 620  
Pro Arg Gly Ser Pro Gln Val Glu Glu Asn Val Pro  
625 630 635  
Asp Gly His Val Ile Thr Gln Glu Leu Arg Ala Thr  
640 645

**FIG. 2C**

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Asp Pro Asp Thr Thr Ala Asp Leu Arg Phe Glu Ile  
650 655 660  
Asn Trp Asp Thr Ser Phe Ala Thr Lys Gln Gly Arg  
665 670  
Gln Ala Asn Pro Asp Glu Phe Arg Asn Cys Val Glu  
675 680  
Ile Glu Thr Ile Phe Pro Glu Ile Asn Asn Arg Gly  
685 690 695  
Leu Ala Ile Gly Arg Val Val Ala Arg Glu Ile Arg  
700 705  
His Asn Val Thr Ile Asp Tyr Glu Glu Phe Glu Val  
710 715 720  
Leu Ser Leu Thr Val Arg Val Arg Asp Leu Asn Thr  
725 730  
Val Tyr Gly Asp Asp Tyr Asp Glu Ser Met Leu Thr  
735 740  
Ile Thr Ile Ile Asp Met Asn Asp Asn Ala Pro Val  
745 750 755 CAD7  
Trp Val Glu Gly Thr Leu Glu Gln Asn Phe Arg Val  
→ 760 765  
Arg Glu Met Ser Ala Gly Gly Leu Val Val Gly Ser  
770 775 780  
Val Arg Ala Asp Asp Ile Asp Gly Pro Leu Tyr Asn  
785 790  
Gln Val Arg Tyr Thr Ile Phe Pro Arg Glu Asp Thr  
795 800  
Asp Lys Asp Leu Ile Met Ile Asp Phe Leu Thr Gly  
805 810 815  
Gln Ile Ser Val Asn Thr Ser Gly Ala Ile Asp Ala  
820 825  
Asp Thr Pro Pro Arg Phe His Leu Tyr Tyr Thr Val  
830 835 840  
Val Ala Ser Asp Arg Cys Ser Thr Glu Asp Pro Ala  
845 850  
Asp Cys Pro Pro Asp Pro Thr Tyr Trp Glu Thr Glu  
855 860

FIG. 2D

**18/21**

Gly Asn Ile Thr Ile His Ile Thr Asp Thr Asn Asn  
865   875  
  | CAD8  
Lys Val Pro Gln Ala Glu Thr Thr Lys Phe Asp Thr  
880   885  
Val Val Tyr Ile Tyr Glu Asn Ala Thr His Leu Asp  
890   895   900  
Glu Val Val Thr Leu Ile Ala Ser Asp Leu Asp Arg  
905   910  
Asp Glu Ile Tyr His Thr Val Ser Tyr Val Ile Asn  
915   920  
Tyr Ala Val Asn Pro Arg Leu Met Asn Phe Phe Ser  
925   930   935  
Val Asn Arg Glu Thr Gly Leu Val Tyr Val Asp Tyr  
940   945  
Glu Thr Gln Gly Ser Gly Glu Val Leu Asp Arg Asp  
950   955   960  
Gly Asp Glu Pro Thr His Arg Ile Phe Phe Asn Leu  
965   970  
Ile Asp Asn Phe Met Gly Glu Gly Glu Asn Arg  
975   980  
Asn Gln Asn Asp Thr Glu Val Leu Val Ile Leu Leu  
985   990   995  
  | CAD9  
Asp Val Asn Asp Asn Ala Pro Glu Leu Pro Pro Pro  
1000   1005  
Ser Glu Leu Ser Trp Thr Ile Ser Glu Asn Leu Lys  
1010   1015   1020  
Gln Gly Val Arg Leu Glu Pro His Ile Phe Ala Pro  
1025   1030  
Asp Arg Asp Glu Pro Asp Thr Asp Asn Ser Arg Val  
1035   1040  
Gly Tyr Glu Ile Leu Asn Leu Ser Thr Glu Arg Asp  
1045   1050   1055  
Ile Glu Val Pro Glu Leu Phe Val Met Ile Gln Ile  
1060   1065  
Ala Asn Val Thr Gly Glu Leu Glu Thr Ala Met Asp  
1070   1075   1080

**FIG. 2E**

**19/21**

Leu Lys Gly Tyr Trp Gly Thr Tyr Ala Ile His Ile  
1085 1090

Arg Ala Phe Asp His Gly Ile Pro Gln Met Ser Met  
1095 1100

Asn Glu Thr Tyr Glu Leu Ile Ile His Pro Phe Asn  
1105 1110 → CAD10 1115

Tyr Tyr Ala Pro Glu Phe Val Phe Pro Thr Asn Asp  
1120 1125

Ala Val Ile Arg Leu Ala Arg Glu Arg Ala Val Ile  
1130 1135 1140

Asn Gly Val Leu Ala Thr Val Asn Gly Glu Phe Leu  
1145 1150

Glu Arg Ile Ser Ala Thr Asp Pro Asp Gly Leu His  
1155 1160

Ala Gly Val Val Thr Phe Gln Val Val Gly Asp Glu  
1165 1170 1175

Glu Ser Gln Arg Tyr Phe Gln Val Val Asn Asp Gly  
1180 1185

Glu Asn Leu Gly Ser Leu Arg Leu Leu Gln Ala Val  
1190 1195 1200

Pro Glu Glu Ile Arg Glu Phe Arg Ile Thr Ile Arg  
1205 1210

Ala Thr Asp Gln Gly Thr Asp Pro Gly Pro Leu Ser  
1215 1220

Thr Asp Met Thr Phe Arg Val Val Phe Val Pro Thr  
1225 1230 → CAD11 1235

Gln Gly Glu Pro Arg Phe Ala Ser Ser Glu His Ala  
1240 1245

Val Ala Phe Ile Glu Lys Ser Ala Gly Met Glu Glu  
1250 1255 1260

Ser His Gln Leu Pro Leu Ala Gln Asp Ile Lys Asn  
1265 1270

His Leu Cys Glu Asp Asp Cys His Ser Ile Tyr Tyr  
1275 1280

Arg Ile Ile Asp Gly Asn Ser Glu Gly His Phe Gly  
1285 1290 1295

**20/21**

Leu Asp Pro Val Arg Asn Arg Leu Phe Leu Lys Lys  
1300 1305  
Glu Leu Ile Arg Glu Gln Ser Ala Ser His Thr Leu  
1310 1315 1320  
Gln Val Ala Ala Ser Asn Ser Pro Asp Gly Gly Ile  
1325 1330  
Pro Leu Pro Ala Ser Ile Leu Thr Val Thr Val Thr  
1335 1340  
Val Arg Glu Ala Asp Pro Arg Pro Val Phe Val Arg  
1345 1350 1355  
Glu Leu Tyr Thr Ala Gly Ile Ser Thr Ala Asp Ser  
1360 1365  
Ile Gly Arg Glu Leu Leu Arg Leu His Ala Thr Gln  
1370 1375 1380  
Ser Glu Gly Ser Ala Ile Thr Tyr Ala Ile Asp Tyr  
1385 1390  
Asp Thr Met Val Val Asp Pro Ser Leu Glu Ala Val  
1395 1400  
Arg Gln Ser Ala Phe Val Leu Asn Ala Gln Thr Gly  
1405 1410 1415  
Val Leu Thr Leu Asn Ile Gln Pro Thr Ala Thr Met  
1420 1425  
His Gly Leu Phe Lys Phe Glu Val Thr Ala Thr Asp  
1430 1435 1440  
Thr Ala Gly Ala Gln Asp Arg Thr Asp Val Thr Val  
1445 1450  
Tyr Val Val Ser Ser Gln Asn Arg Val Tyr Phe Val  
1455 1460  
Phe Val Asn Thr Leu Gln Gln Val Glu Asp Asn Arg  
1465 1470 1475  
Asp Phe Ile Ala Asp Thr Phe Ser Ala Gly Phe Asn  
1480 1485  
Met Thr Cys Asn Ile Asp Gln Val Val Pro Ala Asn  
1490 1495 1500  
Asp Pro Val Thr Gly Val Ala Leu Glu His Ser Thr  
1505 1510

**FIG. 2G**

**21/21**

Gln Met Arg Gly His Phe Ile Arg Asp Asn Val Pro  
1515 1520  
Val Leu Ala Asp Glu Ile Glu Gln Ile Arg Ser Asp  
1525 1530 1535  
Leu Val Leu Leu Ser Ler Ile Gln Thr Thr Leu Ala  
1540 1545  
Ala Arg Ser Leu Val Leu Gln Asp Leu Leu Thr Asn  
1550 1555 1560  
Ser Ser Pro Asp Ser Ala Pro Asp Ser Ser Leu Thr  
1565 1570  
Val Thr Val Leu Ala Ser Leu Ser Ala Val Leu Gly  
1575 1580  
Phe Met Cys Leu Val Leu Leu Leu Thr Phe Ile Ile  
1585 1590 1595  
Arg Thr Arg Ala Leu Asn Arg Arg Leu Glu Ala Leu  
1600 1605  
Ser Met Thr Lys Tyr Gly Ser Leu Asp Ser Gly Leu  
1610 1615 1620  
Asn Arg Ala Gly Ile Ala Ala Pro Gly Thr Asn Lys  
1625 1630  
His Thr Val Glu Gly Ser Asn Pro Ile Phe Asn Glu  
1635 1640  
Ala Ile Lys Thr Pro Asp Leu Asp Ala Ile Ser Glu  
1645 1650 1655  
Gly Ser Asn Asp Ser Asp Leu Ile Gly Ile Glu Asp  
1660 1665  
Leu Pro His Phe Gly Asn Val Phe Met Asp Pro Glu  
1670 1675 1680  
Val Asn Glu Lys Ala Asn Gly Tyr Pro Glu Val Ala  
1685 1690  
Asn His Asn Asn Asn Phe Ala Phe Asn Pro Thr Pro  
1695 1700  
Phe Ser Pro Glu Phe Val Asn Gly Gln Phe Arg Lys  
1705 1710 1715

Ile